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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Saila Mariatta Karvinen

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THE NATH LAW GROUP

112 South West Street

Alexandria, VA 22314

EXAMINER

HANOR, SERENA L

ART UNIT

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1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,216	Applicant(s) KARVINEN ET AL.	
	Examiner SERENA L. HANOR	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17,21,22 and 26-44 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13,22 and 44 is/are allowed.
- 6) ☒ Claim(s) 1-12,14-17,21 and 26-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION***Double Patenting***

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Applicant is advised that should claim 14 be found allowable, claim 17 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The person having ordinary skill in the art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

Claims 1-12, 14-17, 21 and 26-43 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jones et al. (U.S. Patent No. 5,024,827) in view of Li et al. (A novel method for preparation of nanocrystalline rutile TiO_2 powders by liquid hydrolysis of TiCl_4).

Jones et al. disclose a process for manufacturing a particulate titanium dioxide product, comprising:

- i. providing an aqueous solutions of titanium oxychloride having a content of 147 g TiO_2/l calculated as TiO_2 (col. 3 lines 29-34, *Applicants' claims 1, 26 and 27*);
- ii. adding anatase (col. 3 lines 11-12, *Applicants' claim 6*) titanium dioxide particles as crystal nuclei (col. 2 lines 3-17) at 0.3-3% by weight calculated on the basis of the total titanium content in the solution of titanium oxychloride and expressed as TiO_2 (col. 2 lines 25-29, *Applicants' claims 3 and 28-30*), as a suspension (aqueous suspension) with a content of 43.4 g TiO_2/l (col. 3 lines 29-38, *Applicants' claims 4 and 31-35*), to the aqueous solution of titanium oxychloride;

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- iii. precipitating hydrated titanium dioxide particles at a temperature up to 200°C (col. 2 line 67-col. 3 line 4, *Applicants' claims 1, 7 and 38*) in an autoclave (i.e. under normal pressure) (col. 3 lines 43-46, *Applicants' claim 1*);
- iv. washing the precipitated product titanium dioxide product with a base to a pH of 6-10 (col. 3 lines 47-50, *Applicants' claims 8 and 39*) (acetone is known to have a pH of about 7); and
- v. calcining the precipitated hydrated titanium dioxide product at a temperature >500°C (col. 3 lines 5-13, *Applicants' claim 1*).

The photocatalytically active titanium dioxide product (col. 3 lines 14-16, *Applicants' claims 14, 17 and 21*) has the following properties:

- a) crystals with an average diameter of 10-200 nm (col. 1 lines 28-31, *Applicants' claim 10, 40 and 41*)
- b) activity in the UV region of light (col. 3 lines 14-16, *Applicants' claim 15*)
- c) activity in the visible region of light (col. 3 lines 14-16, *Applicants' claim 16*)

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). See MPEP 2113 [R-1]. *Applicants' claims 14, 17 and 21*.

Jones et al. differ from the instant invention in that the content of TiO₂ of the aqueous titanium oxychloride solution overlaps and/or falls within the range of the instantly claimed content.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have selected** *a content of TiO₂ disclosed by the instant invention*, as per Applicants' claims 1 and 2, **because** a prima facie case of obviousness exists in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art". *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness." *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05 [R-5].

Jones et al. differ from the instant invention in that the percentage range of TiO₂ particles added as crystal nuclei overlaps and/or lies within the instantly claimed range.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have selected** *a percentage of TiO₂ particles that overlaps with the instant invention*, as per Applicants' claims 3 and 28-30, **because** a prima facie case of obviousness exists in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art". *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range

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is sufficient to establish a prima facie case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05 [R-5].

Jones et al. differ from the instant invention in that the TiO₂ content of the aqueous suspension overlaps and/or lies within the instantly claimed range.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have selected** a TiO₂ content of the aqueous suspension that overlaps with that of the instant invention, as per Applicants’ claims 4 and 31-35, **because** a prima facie case of obviousness exists in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art”. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, “[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05 [R-5].

Jones et al. do not disclose the size of the titanium dioxide particles added as crystal nuclei.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have used** a titanium dioxide particle size within the instantly claimed range, as per Applicants’ claims 5 and 36, **because** “[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art’s functioning, does not render the old composition patentably new to the discoverer.”

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Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). See MPEP 2112 [R-3] I.

Jones et al. differ from the instant invention in that the crystal form of the titanium dioxide particles to be added is not explicitly disclosed.

Li et al. disclose adding rutile titanium dioxide particles as crystal nuclei in order to yield a rutile product (p. 1387 col. 2, *Applicants' claims 6, 12, 37 and 43*).

It would have been obvious to one of ordinary skill in the art at the time of the invention **to have known** *that an anatase nuclei would yield an anatase product, just as a rutile nuclei would yield a rutile product*, as per Applicants' claims 6, 12, 37 and 43, **because** of the **expected result** of anatase nuclei yielding an anatase product and rutile nuclei yielding a rutile product, and as per Jones et al. (col. 3 line 11-12) in the case of anatase nuclei yielding an anatase product, a product would retain its anatase characteristics unless a rutilising agent were used.

Jones et al. differ from the instant invention in that the precipitation reaction temperature overlaps and/or lies within the instantly claimed range.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have selected** *a precipitation temperature disclosed by the instant invention*, as per Applicants' claims 1, 7 and 38, **because** a prima facie case of obviousness exists in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art". *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to

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establish a prima facie case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05 [R-5].

Jones et al. differ from the instant invention in that the calcination temperature is slightly outside the instantly claimed range.

Li et al. disclose a calcination temperature of 150°C, with rutile nuclei and a rutile product (p. 1387 col. 2, *Applicants’ claims 1, 6, 9, 12, 37 and 43*)

It would have been obvious to one of ordinary skill in the art at the time the invention was made **to have selected** *a calcination temperature within the instantly claimed range using rutile nuclei to yield a rutile product*, as per Applicants’ claims 1, 6, 9, 12, 37 and 43, **because** a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Furthermore, when using rutile nuclei to obtain a rutile product, a lower calcination temperature is obviously preferred, in other words a temperature that lies within the instantly claimed range.

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Jones et al. do not disclose the specific surface area of the titanium dioxide product.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have expected** a titanium dioxide product with a specific surface area within the instantly claimed range, as per Applicants' claims 11 and 42, **because** "[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). See MPEP 2112 [R-3] I. Furthermore, it is reasonable to assume that because the process of Jones et al. in view of Li et al. presents a *prima facie* case of obviousness over the instant invention, the products of both process would have similar characteristics.

Jones et al. differ from the instant invention in that the diameter of the titanium dioxide particles overlaps and/or falls within the range of the instantly claimed diameter.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have selected** *the reaction conditions necessary to yield a titanium dioxide product with a particle size with an average diameter within the instantly claimed range*, as per Applicants' claims 10, 40 and 41, **because** a *prima facie* case of obviousness exists in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art". *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient

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to establish a prima facie case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05 [R-5].

Jones et al. differ from the instant invention in that the TiO₂ content of the titanium oxychloride solution overlaps and/or lies within the instantly claimed range.

It would have obvious to one of ordinary skill in the art at the time of the invention **to have selected** a TiO₂ content of the titanium oxychloride solution that overlaps with that of the instant invention, as per Applicants’ claims 1 and 26, **because** a prima facie case of obviousness exists in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art”. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, “[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05 [R-5].

Jones et al. differ from the instant invention in that the TiO₂ content of the titanium oxychloride solution is slightly outside the instantly claimed range.

It would have been obvious to one of ordinary skill in the art at the time the invention was made **to have selected** a TiO₂ content of the titanium oxychloride solution that overlaps with that of the instant invention, as per Applicants’ claim 27, **because** a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v.*

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Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Claims 1-12, 14-17, 21 and 26-43 have been rejected.

Claims 13, 22 and 44 have not been rejected under either 35 U.S.C. 102 or 35 U.S.C. 103 because the limitations of these claims are not taught in the reference(s) of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SERENA L. HANOR whose telephone number is (571)270-3593. The examiner can normally be reached on Monday - Thursday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SLH

/Timothy C Vanoy/
Primary Examiner, Art Unit 1793